This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1-77. (canceled)

78. (new) A method of making a heterogeneous building block array, the method comprising:

forming a plurality of spots on a solid support, the spots comprising a plurality of building blocks;

coupling a plurality of building blocks to the solid support in the spots;

wherein one or more of the building blocks comprises one or more amino acids.

79. (new) The method of claim 78, wherein one or more of the amino acids comprises naturally occurring amino acid or synthetic amino acid.

80. (new) The method of claim 78, wherein one or more of the amino acids comprises an amino acid with a functional group on its side chain.

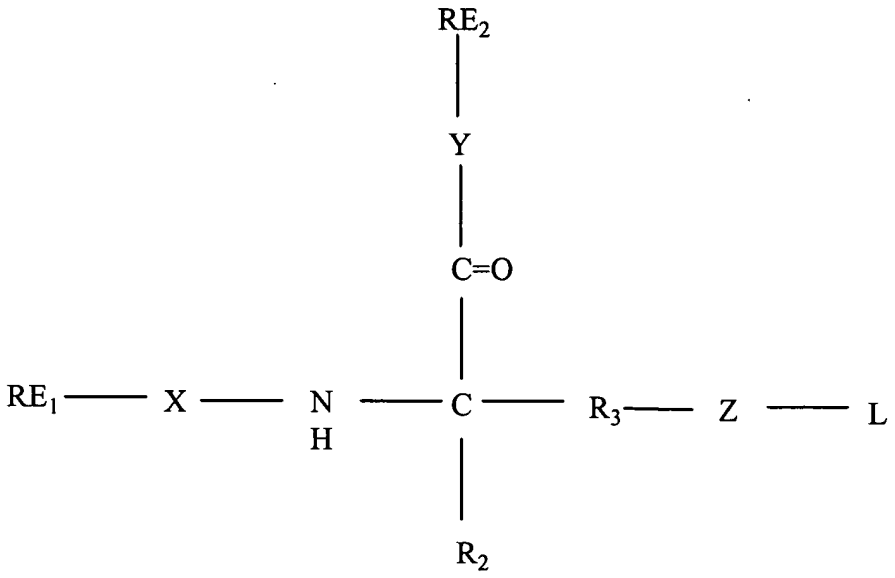
81. (new) The method of claim 80, wherein the functional group comprises amine, hydroxyl, phenol, carboxyl, thiol, thioether, or amidino group.

82. (new) The method of claim 78, wherein one or more of the amino acids comprises serine, threonine, tyrosine, aspartic acid, glutamic acid, asparagine, glutamine, cysteine, lysine, arginine, histidine.

83. (new) The method of claim 78, wherein one or more of the amino acids comprises framework and recognition element.

84. (new) The method of claim 78, wherein one or more of the amino acids comprises derivatized amino acid.

85. (new) The method of claim 84, wherein one or more of the derivatized amino acids has the formula:



in which:

X is absent or C=O;

Y is absent, NH, or O; Z is O;

R_2 is H or CH_3;

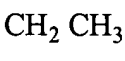
R_3 is CH_2 or CH_2-phenyl;

RE_1 is B1, B2, B3, B4, B5, B6, B7, B8, B9, A1, A2, A3, A4, A5, A6, A7, A8, or A9;

RE_2 is A1, A2, A3, A4, A5, A6, A7, A8, A9, B1, B2, B3, B4, B5, B6, B7, B8, or B9;

L is $(CH_2)_nCOOH$, with n=1-16;

A1 is



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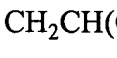
A2 is



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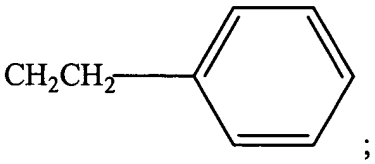
A3 is



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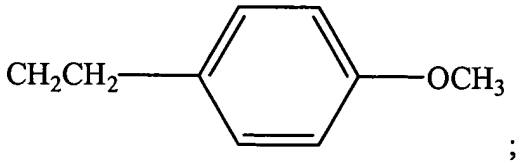
A4 is



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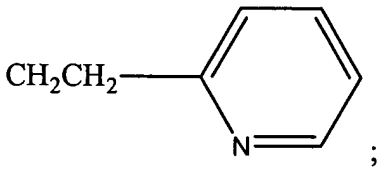
A5 is



;

A6 is

CH_2CH_2-O-CH_3;

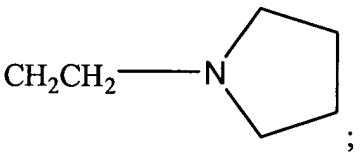
A7 is

CH_2CH_2-OH;

A8 is

CH_2CH_2-NH-C(O)CH_3;

A9 is

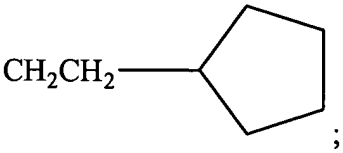


;

B1 is

CH_3;

B2 is



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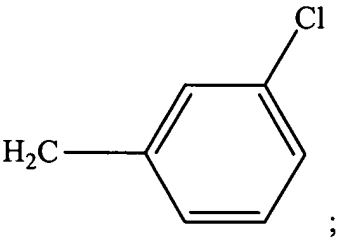
B3 is



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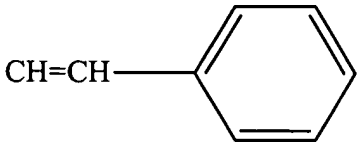
B4 is



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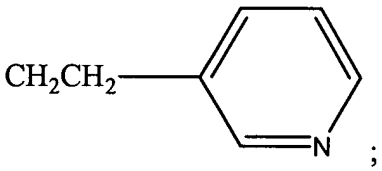
B5 is



;

B6 is

CH_2-S-CH_3;

B7 is

$CH_2CH(OH)CH_3$;

B8 is

$CH_2CH_2C(O)$-NH_2; and

B9 is

$CH_2CH_2CH_2$-N-$(CH_3)_2$.

86. (new) The method of claim 78, wherein one or more of the building blocks consists of one or more amino acids

87. (new) The method of claim 78, wherein one or more of the building blocks has the formula:

linker-framework-(recognition element).

88. (new) The method of claim 87, wherein the framework is naturally occurring amino acid or synthetic amino acid.

89. (new) The method of claim 88, wherein the framework is naturally occurring amino acid, and the naturally occurring amino acid is serine, threonine, tyrosine, aspartic acid, glutamic acid, asparagine, glutamine, cysteine, lysine, arginine, histidine.

90. (new) The method of claim 87, wherein the recognition element comprises amino acid side chain functional group.

91. (new) The method of claim 90, wherein the functional group comprises amine, hydroxyl, phenol, carboxyl, thiol, thioether, or amidino group.

92. (new) The method of claim 87, wherein the recognition element comprises amine, hydroxyl, phenol, carboxyl, thiol, thioether, or amidino group.

93. (new) The method of claim 78, wherein one or more of the spots comprises 2, 3, 4, 5, or 6 different building blocks.

94. (new) A method of making a receptor surface, the method comprising:
forming a region on a solid support, the region comprising a plurality of building blocks;
coupling the plurality of building blocks to the solid support in the region;
wherein one or more of the building blocks comprises one or more amino acids.

95. (new) A method of making an artificial receptor, the method comprising:
forming a region on a support, the region comprising a plurality of building blocks;
coupling the plurality of building blocks to the support in the region;
wherein one or more of the building blocks comprises one or more amino acids.

96. (new) The method of claim 95, wherein the region is a spot.

97. (new) A method of using an artificial receptor comprising:
contacting a first heterogeneous molecular array with a test ligand;
the array comprising:
a support; and
a plurality of spots of building blocks attached to the support;

the spots of building blocks comprising a plurality of building blocks; and

the building blocks being coupled to the support;

one or more of the building blocks comprising one or more amino acids;

detecting binding of a test ligand to one or more spots; and

selecting one or more of the binding spots as the artificial receptor;

wherein the building blocks in the array define a first set of building blocks, and the plurality of building blocks in the one or more binding spots defines one or more selected binding combination of building blocks.

98. (new) The method of claim 97, further comprising:

determining the combinations of building blocks in the one or more binding spots;

developing, based on the combinations determined, one or more developed combinations of building blocks distinct from those in the one or more selected combinations of building blocks;

contacting a second heterogeneous molecular array with the test ligand,

the second heterogeneous molecular array comprising a plurality of spots,

the spots comprising a developed combination of building blocks;

one or more of the building blocks comprising one or more amino acids;

detecting binding of a test ligand to one or more spots of the second heterogeneous molecular array; and

selecting one or more of the spots of the second heterogeneous molecular array as the artificial receptor;

wherein the building blocks in the second heterogeneous molecular array define a second set of building blocks.

99. (new) A composition comprising:

a support; and

a portion of the support comprising a plurality of building blocks;

the building blocks being coupled to the support;

one or more of the building blocks comprising one or more amino acids.

100. (new) The composition of claim 99, wherein one or more of the amino acids comprises naturally occurring amino acid or synthetic amino acid.

101. (new) The composition of claim 99, wherein one or more of the amino acids comprises an amino acid with a functional group on its side chain.

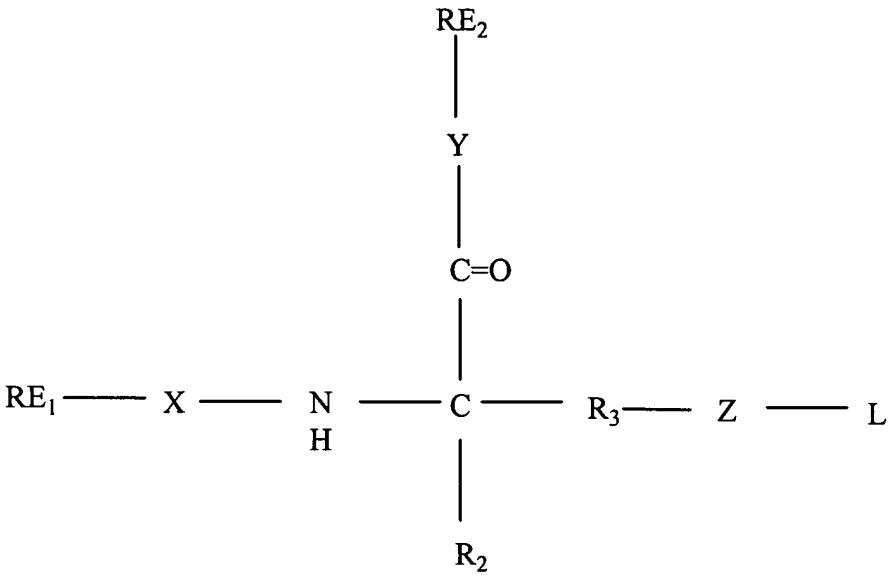
102. (new) The composition of claim 101, wherein the functional group comprises amine, hydroxyl, phenol, carboxyl, thiol, thioether, or amidino group.

103. (new) The composition of claim 99, wherein one or more of the amino acids comprises serine, threonine, tyrosine, aspartic acid, glutamic acid, asparagine, glutamine, cysteine, lysine, arginine, histidine.

104. (new) The composition of claim 99, wherein one or more of the amino acids comprises framework and recognition element.

105. (new) The composition of claim 99, wherein one or more of the amino acids comprises derivatized amino acid.

106. (new) The composition of claim 104, wherein one or more of the derivatized amino acids has the formula:



in which:

X is absent or C=O;

Y is absent, NH, or O; Z is O;

R_2 is H or CH_3;

R_3 is CH_2 or CH_2-phenyl;

RE_1 is B1, B2, B3, B4, B5, B6, B7, B8, B9, A1, A2, A3, A4, A5, A6, A7, A8, or A9;

RE_2 is A1, A2, A3, A4, A5, A6, A7, A8, A9, B1, B2, B3, B4, B5, B6, B7, B8, or B9;

L is $(CH_2)_nCOOH$, with n=1-16;

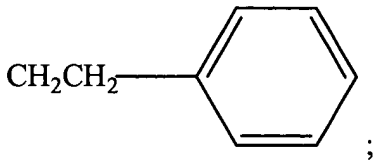
A1 is

CH_2 CH_3;

A2 is

$CH_2CH(CH_3)_2$;

A3 is



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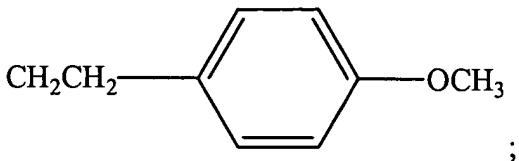
A4 is



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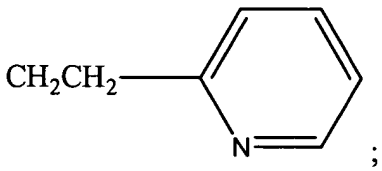
A5 is



;

A6 is

CH_2CH_2-O-CH_3;

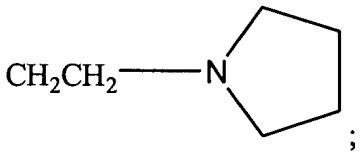
A7 is

CH_2CH_2-OH;

A8 is

CH_2CH_2-NH-C(O)CH_3;

A9 is

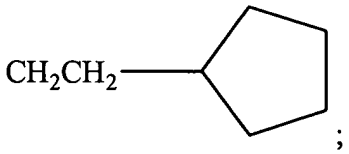


;

B1 is

CH_3;

B2 is



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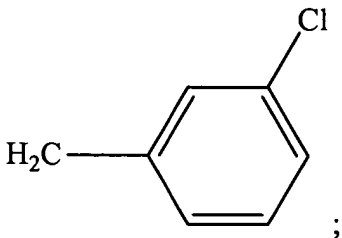
B3 is



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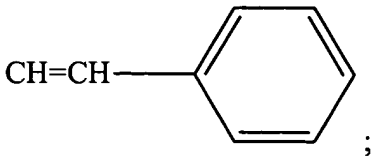
B4 is



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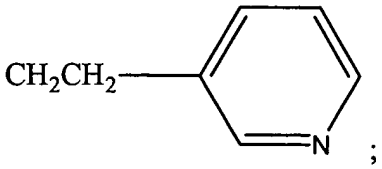
B5 is



;

B6 is

CH_2-S-CH_3;

B7 is

$CH_2CH(OH)CH_3$;

B8 is

$CH_2CH_2C(O)$-NH_2; and

B9 is

$CH_2CH_2CH_2$-N-$(CH_3)_2$.

107. (new) The composition of claim 99, wherein one or more of the building blocks consists of one or more amino acids

108. (new) The composition of claim 99, wherein one or more of the building blocks has the formula:

linker-framework-(recognition element).

109. (new) The composition of claim 108, wherein the framework is naturally occurring amino acid or synthetic amino acid.

110. (new) The composition of claim 109, wherein the framework is naturally occurring amino acid, and the naturally occurring amino acid is serine, threonine, tyrosine, aspartic acid, glutamic acid, asparagine, glutamine, cysteine, lysine, arginine, histidine.

111. (new) The composition of claim 108, wherein the recognition element comprises amino acid side chain functional group.

112. (new) The composition of claim 111, wherein the functional group comprises amine, hydroxyl, phenol, carboxyl, thiol, thioether, or amidino group.

113. (new) The composition of claim 108, wherein the recognition element comprises amine, hydroxyl, phenol, carboxyl, thiol, thioether, or amidino group.

114. (new) The composition of claim 99, comprising a plurality of spots on the support;

the spots comprising a plurality of building blocks; and

the building blocks being coupled to the support.

115. (new) The composition of claim 114, wherein the spots are configured in an array.

116. (new) The composition of claim 99, comprising a functionalized lawn coupled to the support and the building blocks coupled in spots to the lawn.

117. (new) An artificial receptor, the artificial receptor comprising a plurality of building blocks coupled to a support;

one or more of the building blocks comprising one or more amino acids.

118. (new) A heterogeneous building block array comprising:

a support; and

a plurality of spots on the support;

the spots comprising a plurality of building blocks; and

the building blocks being coupled to the support;

wherein one or more of the building blocks comprises one or more amino acids.

119. (new) A composition comprising:

a surface; and

a region on the surface comprising a plurality of building blocks;

the building blocks being coupled to the support;

one or more of the building blocks comprising one or more amino acids.

120. (new) A composition of matter comprising a plurality of building blocks;

one or more of the building blocks having the formula:

linker-framework-(first recognition element)(second recognition element); and

one or more of the building blocks comprising one or more amino acids.

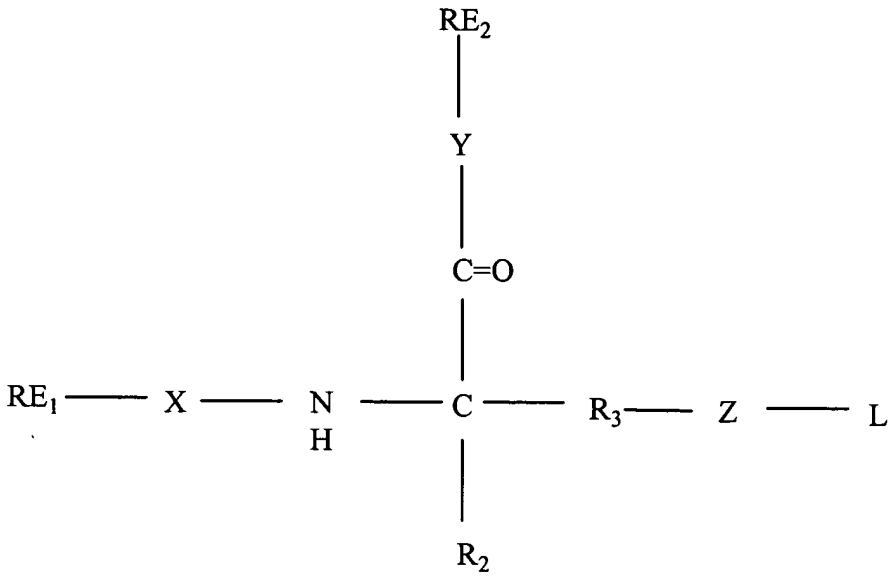
121. (new) The composition of matter of claim 120, wherein one or more of the amino acids comprises naturally occurring amino acid or synthetic amino acid.

122. (new) The composition of matter of claim 120, wherein one or more of the amino acids comprises serine, threonine, tyrosine, aspartic acid, glutamic acid, asparagine, glutamine, cysteine, lysine, arginine, histidine.

123. (new) The composition of matter of claim 120, wherein one or more of the amino acids comprises framework and recognition element.

124. (new) The composition of matter of claim 120, wherein one or more of the amino acids comprises derivatized amino acid.

125. (new) The composition of matter of claim 124, wherein one or more of the derivatized amino acids has the formula:



in which:

X is absent or C=O;

Y is absent, NH, or O; Z is O;

R_2 is H or CH_3;

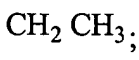
R_3 is CH_2 or CH_2-phenyl;

RE_1 is B1, B2, B3, B4, B5, B6, B7, B8, B9, A1, A2, A3, A4, A5, A6, A7, A8, or A9;

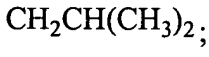
RE_2 is A1, A2, A3, A4, A5, A6, A7, A8, A9, B1, B2, B3, B4, B5, B6, B7, B8, or B9;

L is $(CH_2)_nCOOH$, with n=1-16;

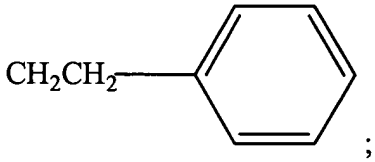
A1 is



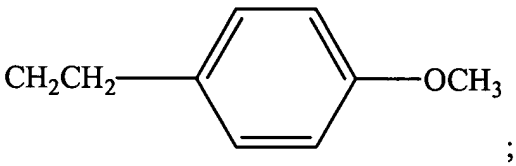
A2 is



A3 is



A4 is



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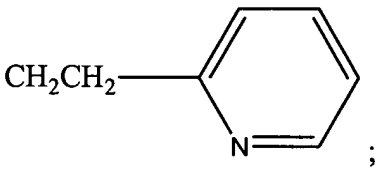
A5 is



;

A6 is

CH_2CH_2-O-CH_3;

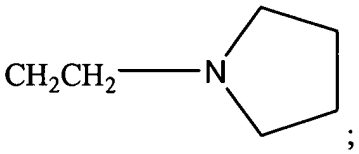
A7 is

CH_2CH_2-OH;

A8 is

CH_2CH_2-NH-C(O)CH_3;

A9 is

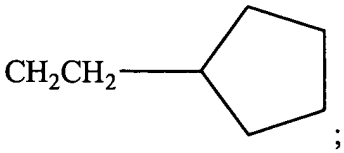


;

B1 is

CH_3;

B2 is



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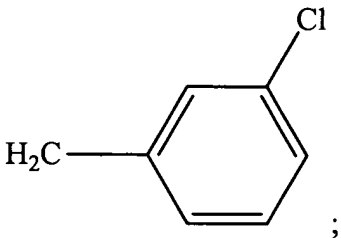

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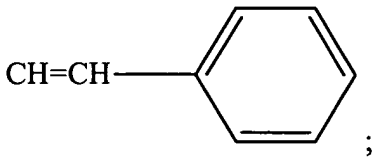

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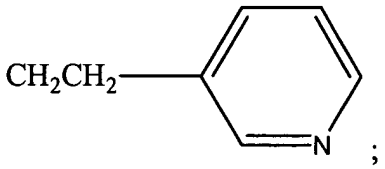
B5 is



;

B6 is

CH_2-S-CH_3;

B7 is

$CH_2CH(OH)CH_3$;

B8 is

$CH_2CH_2C(O)$-NH_2; and

B9 is

$CH_2CH_2CH_2$-N-$(CH_3)_2$.

126. (new) The composition of matter of claim 120, wherein one or more of the building blocks has the formula:

linker-framework-(recognition element).

127. (new) The composition of matter of claim 126, wherein the framework is naturally occurring amino acid or synthetic amino acid.

128. (new) The composition of matter of claim 126, wherein the recognition element comprises amino acid side chain functional group.

129. (new) The composition of matter of claim 120, comprising about 10 to about 200 distinct building blocks.

130. (new) The composition of matter of claim 120, wherein the building blocks are coupled to a support.